

REMARKS

Claims 1-16 are all the claims pending in the application.

The Applicants traverse the rejections and request reconsideration.

Information Disclosure Statement

The Examiner has required that relevant pages of the text book by Dr. T. Kokuni be submitted as part of an IDS. The Applicants respectfully include such as an IDS.

Claim Rejections Under 35 U.S.C. § 101

The Examiner maintains the rejection of claims 1-16 under 35 U.S.C. § 101.

The gist of the Examiner's argument relate to his allegation that the claims merely recite a manipulation of abstract ideas and do not relate to a practical application. The Applicants respectfully disagree with the Examiner's interpretation of the legal requirement as well as with his allegation that the present claims only recite abstract manipulation of ideas.

However, for a speedier prosecution of the case, the independent claims are amended to include a limitation related to using the coefficient matrix for solving the linear simultaneous equations.

Claim Rejections Under 35 U.S.C. § 112

The Examiner maintains the rejection of claims 5, 6, 11 and 12 under 35 U.S.C. § 112, first paragraph. The Applicants reiterate that a skilled programmer in the field of matrix computation will be able to implement the a "determinator" and a "replacer" without undue experimentation. Specifically, because the actual function of these units are provided in the claims themselves with a specific embodiment described in relation to Fig. 1. For example, the

Claim Rejections Under 35 U.S.C. § 103

Claims 1-16 are rejected under U.S.C. 103(a) as being unpatentable over Garg and Eberly.

A feature of the present invention as recited in claim 1 is the determination of a first and second combination of rows and columns based on the number of non-zero elements and an accumulative processing time for the Gaussian elimination method. Likewise, in claim 2, the determination is based on the number of non-zero elements and lengths of critical paths. Other independent claims 5-8 and 11-12 include analogous features.

The Examiner contends that Garg teaches determination of the **number of non-zero elements**. This is believed to be incorrect. Garg does not suggest determining the number of non-zero elements. In fact, it is not believed that the method used by Garg requires a determination of the number of non-zero elements. Garg performs Cholesky factorization. In such a technique, factorization is performed in such a way that the number of zero elements being replaced by non-zero elements is reduced (See Garg 533-37). Garg also suggests determining supernodes which have similar patterns of non-zero elements (See Garg 3:1-5). However, nowhere is there a suggestion for determining the number of non-zero elements. The Examiner is respectfully requested to specifically point out where in Garg a determination of a **number of non-zero elements** is suggested.

The Examiner admits that Garg does not disclose determining the first and second combination based on accumulative processing time for the Gaussian elimination or based on a length of a critical path. However, according to the Examiner, this feature is suggested by Eberly. The teachings of Eberly appears to have been misunderstood.

The teachings of Eberly are related to finding the determinants of non-singular band matrices using a parallel Las Vegas Algorithm. Such band matrices are defined to be sparse matrices whose non-zero values are clustered in a band near the diagonal (*see* Eberly p. 457, col. 2, ll. 10-15). The Examiner cites the Abstract of Eberly in support of the alleged teaching regarding accumulative processing time for Gaussian elimination and a determination of a length of a critical path. However, the Abstract merely mentions that the processing time for the Las Vegas algorithm is less than the processing time for a Gaussian elimination. There is no suggestion for determining a first and second combination of rows and columns based on a processing time for the Gaussian elimination. Likewise, there is no suggestion for determining a first and second combination of rows and columns based on a length of the critical path.

A skilled artisan would not have been able to practice the present invention, as recited in independent claims 1, 5-8, 11 and 12 from the combined teachings of Garg and Eberly.

Claims 2-4, 9, 13-16 are allowable at least based on their dependency.

Additionally, regarding claim 13, the Examiner contends that Eberly suggests selecting/replacing between multiple pivot lines within the matrix. However, claim 13 requires selecting a first pivot whose degree correspond to the number of non-zero elements is under a threshold. The Applicants respectfully submit that merely suggesting selecting between pivot lines is not equivalent to selecting a pivot whose degree is below a threshold.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

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In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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